

KEVIN P. COWAN ET AL.
Serial No.: 09/765,498

In The Claims:

This listing of claims, in which claims 1, 32, 35, 36, 50, 56, 61, 64, 65, 66 and 69 are amended and claim 2 is newly canceled without prejudice, replaces all prior versions, and listings, of claims in the application:

1. (Currently Amended) A syringe comprising:
a body comprising a wall and defining a longitudinal syringe axis; and
a length of material disposed along at least a portion of the wall, the length of material adapted to ~~substantially~~ propagate electromagnetic energy therethrough in a direction substantially parallel to the longitudinal syringe axis, the length of material comprising a plurality of indicators, each of the plurality of indicators located at ~~unique~~ a different predetermined longitudinal position ~~positions~~ along the length of material, each of the indicators being adapted to interact concurrently with at least a portion of the energy being propagated through the length of material in a direction substantially parallel to the longitudinal syringe axis in a manner that is detectable, the predetermined positions of the indicators providing information about the syringe configuration.

2. (Canceled)

3. (Previously Presented) The syringe of Claim 1 wherein each of the indicators is adapted to absorb at least a portion of the energy or to scatter at least a portion of the energy.

4-5. (Canceled)

6. (Original) The syringe of Claim 1 wherein the length of material is formed integrally with the syringe.

7. (Previously Presented) The syringe of Claim 1 wherein the length of material is a portion of the syringe wall.

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8. (Previously Presented) The syringe of Claim 1 wherein the electromagnetic energy is light energy and the length of material has a refractive index greater than the refractive index of an adjacent environment.

9. (Previously Presented) The syringe of Claim 1 wherein at least one of the plurality of indicators comprises an angled surface adapted to transmit light energy outside of the syringe wall.

10. (Previously Presented) The syringe of Claim 1 wherein the plurality of indicators comprises at least a first plurality of indicators located along the length of the syringe wall at unique predetermined positions.

11. (Canceled)

12. (Original) The syringe of Claim 10 wherein the first plurality of indicators represents a first binary code.

13. (Previously Presented) The syringe of Claim 10 wherein the plurality of indicators further comprises at least a second plurality of indicators located along the length of the syringe wall at unique predetermined positions, the second plurality of indicators representing a second binary code.

14-31. (Canceled)

32. (Currently Amended) A syringe comprising:

a body comprising a wall and defining a longitudinal syringe axis; and

a translucent length of material disposed along at least a portion of the wall, the length of material comprising a plurality of indicators formed along the length of material, each of the indicators comprising a first, generally flat surface that is angled with respect to an orientation of light propagated through the length of material in a direction substantially parallel to the longitudinal syringe axis to redirect at least a portion of the light in a manner that is readily detectable, each of the angled surfaces being

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positioned at a different depth within the length of material, the indicators providing information about the syringe configuration.

33. (Previously Presented) The syringe of Claim 32 wherein each indicator defines a notch in the length of material, the notch defining a second surface through which the light passes to contact the first surface, the first surface reflecting a portion of the light.

34. (Canceled)

35. (Currently Amended) A syringe for use with an injector having at a plurality of sensors located at different predetermined longitudinal positions on the injector, the syringe comprising:

a body comprising a wall and defining a longitudinal syringe axis; ~~and~~
an attachment mechanism to attach the syringe to the injector; and

a length of material disposed along at least a portion of the wall, the length of material adapted to ~~substantially~~ propagate electromagnetic energy therethrough in a direction substantially parallel to the longitudinal syringe axis, the length of material comprising at least two a plurality of indicators, each of the indicators being located at unique a different predetermined longitudinal position positions along the length of material, each of the indicators being positioned to longitudinally align with a sensor when the syringe is attached to the injector, each of the indicators being adapted to interact concurrently with at least a portion of the energy being propagated through the length of material in a direction substantially parallel to the longitudinal syringe axis in a manner that is readily detectable by the sensor in longitudinal alignment with the indicator, the first indicator the at least two indicators providing information about the syringe configuration in the form of a binary code on the basis of presence or absence of one of the indicators at a predetermined longitudinal position on the length of material.

36. (Currently Amended) A syringe comprising:

a body comprising a wall and defining a longitudinal syringe axis, a length of the syringe wall being adapted to ~~substantially~~ propagate electromagnetic energy therethrough in a direction generally parallel to the longitudinal syringe axis, the syringe

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wall defining a plurality of indicators positioned at unique and different predetermined longitudinal positions therealong, each of the indicators being adapted to interact concurrently with at least a portion of the energy being propagated through the syringe wall in a manner that is detectable, the unique predetermined positions of the indicators providing information about the syringe configuration.

37. (Previously Presented) The syringe of Claim 36 wherein the electromagnetic energy is light energy.

38. (Previously Presented) The syringe of Claim 36 wherein the plurality of indicators comprises at least a first plurality of indicators positioned along the syringe wall at different longitudinal positions, the first plurality of indicators representing a binary code providing information about the syringe configuration.

39. (Previously Presented) The syringe of Claim 36 wherein the syringe wall is generally cylindrical in shape and the plurality of indicators are aligned along the syringe wall at different longitudinal positions.

40. (Previously Presented) The syringe of Claim 1, further comprising:
a plunger movably disposed in the body.

41. (Previously Presented) The syringe of Claim 40, further comprising at least one mounting flange associated with the body.

42. (Previously Presented) The syringe of Claim 41, further comprising a drip flange associated with the body.

43. (Previously Presented) The syringe of Claim 41 wherein the length of material is associated with the body at a location rearward at least one mounting flange.

44. (Previously Presented) The syringe of Claim 1 wherein each of the plurality of indicators comprises a groove formed around at least a portion of the circumference of the syringe.

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45. (Previously Presented) The syringe of Claim 44 wherein the groove extends along the circumference of the syringe.

46. (Previously Presented) The syringe of Claim 1 wherein each of the plurality of indicators comprises a first, generally flat surface that is angled with respect to the energy propagated through the length of material to redirect at least a portion of the energy in a manner that is readily detectable.

47. (Previously Presented) The syringe of Claim 46 wherein each of the plurality of indicators comprises a notch defined in the length of material, the notch comprising a second surface through which the energy passes to contact the first surface, the first surface reflecting a portion of the energy.

48. (Previously Presented) The syringe of Claim 47 wherein the first surface is angled at approximately 45° to the orientation of the energy propagated through the length of material.

49. (Previously Presented) The syringe of Claim 1 wherein the electromagnetic energy is light energy.

50. (Currently Amended) A syringe comprising:

a body defining a longitudinal axis;

a plunger movably disposed within the body;

a length of material disposed along at least a portion of the body and being adapted to ~~substantially~~ propagate electromagnetic energy therethrough in a direction substantially parallel to the longitudinal axis, the length of material defining a plurality of indicators located at unique predetermined positions therealong, each of the indicators comprising an angled surface adapted to reflect at least a portion of the energy outside of the body in a manner that is detectable, each of the angled surfaces being positioned at a different depth within the length of material, the predetermined positions of the indicators providing information about the syringe configuration; and

at least one mounting flange associated with the body.

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51. (Previously Presented) The syringe of Claim 50 wherein the length of material is integrally formed with the body at a location rearward of the at least one mounting flange.

52. (Previously Presented) The syringe of Claim 50 wherein each of the plurality of indicators comprises a groove formed around at least a portion of the circumference of the syringe.

53. (Previously Presented) The syringe of Claim 52 wherein the groove extends along the circumference of the syringe.

54. (Previously Presented) The syringe of Claim 50 wherein the length of material is integrally formed with the body.

55. (Previously Presented) The syringe of Claim 50, further comprising a drip flange associated with the body at a location forward of the at least one mounting flange.

56. (Currently Amended) A syringe comprising:

a body comprising a length of material integrally formed therewith along at least a portion thereof, the length of material being adapted to substantially propagate electromagnetic energy therethrough in a direction substantially parallel to a longitudinal axis of the body, the length of material defining a plurality of indicators located at unique predetermined positions therealong, each of the indicators comprising an angled surface adapted to reflect at least a portion of the energy outside of the body in a manner that is detectable, each of the angled surfaces being positioned at a different depth within the length of material, the predetermined positions of the indicators providing information about the syringe configuration;

a plunger movably disposed within the body; and

at least one mounting flange associated with the body.

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57. (Previously Presented) The syringe of Claim 56 wherein the length of material is located rearward of the at least one mounting flange.

58. (Previously Presented) The syringe of Claim 56 wherein each of the plurality of indicators comprises a groove formed around at least a portion of the circumference of the syringe.

59. (Previously Presented) The syringe of Claim 58 wherein the groove extends along the circumference of the syringe.

60. (Previously Presented) The syringe of Claim 56, further comprising a drip flange associated with the body at a location forward of the at least one mounting flange.

61. (Currently Amended) A syringe comprising:

a body defining a longitudinal axis;

a plunger movably disposed within the body;

a length of material disposed along at least a portion of the body and being adapted to substantially propagate electromagnetic energy therethrough in a direction substantially parallel to the longitudinal axis, the length of material defining a plurality of indicators located at unique predetermined positions therealong, each of the indicators defining a notch formed in the body and extending along the circumference thereof, each of the notches defining an angled surface adapted to reflect at least a portion of the energy outside of the body in a manner that is detectable, each of the angled surfaces being positioned at a different depth within the length of material, the predetermined positions of the indicators providing information about the syringe configuration; and

62. (Previously Presented) The syringe of Claim 61 wherein the length of material is located rearward of the at least one mounting flange.

63. (Previously Presented) The syringe of Claim 61, further comprising a drip flange associated with the body at a location forward of the at least one mounting flange.

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64. (Currently Amended) A syringe comprising:
a body defining a longitudinal axis and a discharge outlet;
a plunger movably disposed within the body;
at least one mounting flange associated with the body;
a length of material disposed along at least a portion of the body rearward of the at least one mounting flange, the length of material being adapted to substantially propagate light therethrough in a direction substantially parallel to the longitudinal axis, the length of material defining two or more indicators located at unique predetermined positions therealong, each of the indicators defining a notch formed in the body and extending along the circumference thereof, each of the notches defining an angled surface adapted to reflect at least a portion of the light external to the body in a manner that is detectable, each of the angled surfaces being positioned at a different depth within the length of material, the predetermined positions of the indicators providing information about the syringe configuration; and
a drip flange associated with the body at a location forward of the at least one mounting flange.

65. (Currently Amended) A syringe comprising:
a cylindrical main body defining a longitudinal axis;
a plunger movably disposed within the main body;
a mounting flange connected to and extending along the circumference of the main body;
a length of material forming a portion of the main body rearward of the mounting flange, the length of material being adapted to substantially propagate light therethrough in a direction substantially parallel to the longitudinal axis, the length of material defining two or more indicators located at unique predetermined positions therealong, each of the indicators defining a notch formed in the main body and extending along the circumference thereof, each of the notches defining an angled surface adapted to reflect at least a portion of the light external to the main body in a manner that is detectable, each of the angled surfaces being positioned at a different depth within the length of material.

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the predetermined positions of the indicators providing information about the syringe configuration; and

a drip flange connected to and extending along the circumference of the main body at a location forward of the mounting flange.

66. (Currently Amended) A syringe comprising:
a cylindrical main body defining a longitudinal axis;
a plunger movably disposed within the main body;
a mounting flange connected to and extending along the circumference of the main body; and

a length of material defining two or more indicators extending along the circumference of the main body at different predetermined longitudinal positions on the main body, each of the notches defining an angled surface adapted to reflect concurrently, in a manner that is detectable, at least a portion of a light beam being propagated through the length of material in a direction substantially parallel to the longitudinal axis.

67 (Previously Presented) The syringe of Claim 66 wherein the length of material is located rearward of the mounting flange.

68. (Previously Presented) The syringe of Claim 66, further comprising a drip flange connected to and extending along the circumference of the main body at a location forward of the mounting flange.

69. (Currently Amended) A syringe comprising:
a body defining a longitudinal axis;
a plunger movably disposed within the main body;
a mounting flange connected to the body; and
a length of material defining two or more indicators extending along the body, each of the notches defining an angled surface adapted to reflect concurrently, in a manner that is detectable, at least a portion of a light beam being propagated through the length of material in a direction substantially parallel to the longitudinal axis.

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70. (Previously Presented) The syringe of Claim 69 wherein the length of material is located rearward of the mounting flange.

71. (Previously Presented) The syringe of Claim 69, further comprising a drip flange connected to the body at a location forward of the mounting flange.

72. (Previously Presented) The syringe of Claim 69 wherein the two or more indicators extend around the circumference of the body.

73. (Previously Presented) The syringe of Claim 69 wherein the mounting flange extends around the circumference of the body.